

## AMENDMENTS TO THE SPECIFICATION

Please replace paragraph 0015 with the following amended paragraph:

5 ~~Fig.5~~ Fig.5A is a schematic diagram of a matrix driving circuit in the fluid injection head of the present invention.

Please delete paragraph 16 from the specification:

Please replace paragraph 0025 with the following amended paragraph:

10 Please refer to Fig.3 and Fig.4. Fig.3 is a top view of the print head, according to the present invention. In the preferred embodiment, the orifice 12 of the print head is divided into sixteen P groups, P1 to P16, and each P group comprises twenty-two addresses A1 to A22. As shown in ~~Fig.5~~ Fig.5A, which shows a schematic diagram of a matrix  
15 driving circuit, a select signal is generated by a logic circuit or a microprocessor 32 according to the data to be printed. Then, the select signal is transmitted to a power driver 34 and an address driver 35 to determine which A (A1 to A22) should be turned on and to which P (P1 to P16) the power should be provided. For example, providing power  
20 to P1 and turning on A22, the heaters 14a and 14b on the MOSFET 15 of P1A22 will complete an operation of heating and ejecting ink at the predetermined time.

Please replace paragraph 0028 with the following amended paragraph:

25 Please refer to ~~Fig.5A~~ Fig.5B to Fig.5D, which show schematic diagrams of circuits for transmitting signals with the silicon line 23 according to the present invention. Although a poly-silicon line 23 with a length of 2901  $\mu$ m is used as an address conductive trace A1 to A22, the electrical characteristics of the circuits are not deteriorated. First,  
30 very little current exists in the gate 64 of the MOSFET 15 so the heat effect of the poly-silicon lines 23 can be ignored. Second, ~~as shown in Fig.5A,~~ resistance in the conductive trace is increased due to the

poly-silicon line 23 may occur the problem of time delay when the heaters in A1 of all P groups (including P1 to P16) inject. Take two A1 addresses with the largest distance between them, A1-P1 and A1-P16, as example. During printing operation, the frequency of ink-jet printing is set at about 10 KHz. Each address has a switching time of about  $3.5 \mu s$ . Timing of a power supply for a P group must be within a pulse width of  $3.5 \mu s$  so that the timing for power supply of a P group is about  $2 \mu s$ . This means that there is only a time buffer of about 500 ns between each neighboring address. These limitations must be met or errors may occur. For example, in the group P1, the printhead A1 stops and the printhead A2 starts to inject, but the printhead A1 in the group P16 may still be injecting.

Please replace paragraph 0029 with the following amended paragraph:

15 ~~Please refer to Fig.5A.~~ According to the sheet resistances of the metal line 22 ( $0.1 \Omega / \mu m$ ) and the poly-silicon line 23 ( $10 \Omega / \mu m$ ), the equivalent resistances of A1P1 and A1P16 while the gate 64 of all MOSFET device 15 is turned on can be obtained. The equivalent circuit of A1P1 circuit is shown as Fig.5B and that of A1P16 circuit is shown as Fig.5C. In contrast to A1P1, a signal must pass through additional poly-silicon line 23 and a metal line 22 when transmitted to A1P16. The resistance R1 of the additional poly-silicon line 23 is about  $2901 \Omega$ , and the resistance R2 of the additional metal line 22 is about  $147 \Omega$ . A HSPICE simulate is performed for these two circuits and a result is shown in Fig.5D. Comparing time of the clock 50% of A1P1 and A1P16, which are 710 and 716 ns respectively, therefore, the time delay is only about 8 ns. Comparing to the time delay endurance of 500 ns, the time delay of the present invention has no influence on ink injecting.

30 Please replace paragraph 0036 with the following amended paragraph:

The following is a detailed description of the operation of the

present invention. Please refer to Fig.4 and ~~Fig.5~~ Fig.5A. When printing starts, the logic circuit or microprocessor 32 determines which orifices 12 should eject ink according to the data to be printed and generates a select signal. The select signal is transmitted to the power driver 34 and the address driver 32 to turn on the proper A groups (A1 to A22) and apply power to the proper P groups (P1 to P16). Thus, a current is generated and applied to the heaters 14a and 14b to heat fluid and generate bubbles so that ink droplets are ejected. For example, suppose that a droplet is to be ejected from the orifice 12a of A1P1.

5 First, a voltage signal is input from an I/O pad of A1 and transmitted to the gate 64 of MOSFET 15 to turn on the gate 64. Next, another voltage signal is input from an I/O pad of P1 to generate a current. The current passes via the heaters 14a and 14b to the drain 68, the source 66, and the ground 20 so as to heat the fluid and generate bubbles.

10 The bubbles act to eject an ink droplet from the orifice 12a of A1P1.

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